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News Letter

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1959 MONTANA AERONAUTICS CHARTS

The Airport Division of the Montana Aeronautics Commission has completed the revisions to the Montana Aeronautics Chart and the material for the new Chart will be submitted to the Jeppesen Company of Denver about March 15.

The New Chart will be available for distribution about May 1 and will sell as before at $1.00 per copy, with packages of twenty being made available to Flight Operators at a cost of $15.00.

The revised Chart will include VOR Range Bearings on the face of the map and some 80 new private airports, which have been built in Montana since the previous Chart was printed.

The present supply of Charts has been exhausted and a new Chart will be available for distribution on or about May 1. It is suggested that you get your orders in now for Charts and delivery will be made immediately following receipt of the new Charts from the printer.

NATIONAL AVIATION EDUCATION WORKSHOP

An Aviation Education Workshop will be held at Missoula at the State University for teachers from all parts of the United States. The workshop is scheduled to be held between the dates of June 29 and July 31.

This Aviation Education Workshop for teachers is sponsored by the Montana Aeronautics Commission, the United States Air Force, the Civil Air Patrol and the State University. The Air Force is furnishing transportation to teachers from other states throughout the country and it is expected that the enrollment will be from 500 to 800 teachers.

As a part of the Aviation Education Workshop, aviation groups in Western Montana are all getting behind the annual Missoula Aviation Day with a program scheduled to be held on July 4 at the Missoula County Airport. The Air Force has promised an extensive static display of the latest type aircraft, together with exhibition flying by Air Force teams including the top Air Force exhibition acrobatic team, which will be flying super-sonic fighter aircraft. A demonstration by the Air Force of the sonic boom will be made and this will probably be the biggest Aviation Show which has ever taken place in Montana. Be sure and mark your calendar and plan on attending this spectacular Montana Aviation event on July 4th at Missoula.

It is important that our youngsters in the schools be interested in aviation and technical developments. There are unlimited opportunities in the aviation field, which is the biggest industry at this time in our country. Bring the importance of aviation in our school curriculum to the attention of your school administrators and encourage teachers from your community to enroll in this Aviation Education Workshop, for which they will receive eight credits for the five weeks course in compliance with the requirements for their teachers certificates. It is the responsibility of all Montana pilots to get behind this program.

RAPID CITY NOTAM

Extensive ILS/GCA approach activity. It is suggested that VFR operations at or below 5,000 ft. MSL between the Ellsworth TVOR and Ellsworth AFB remain south of the TVOR and below 4,500 ft. MSL or contact Ellsworth Advisory Service on 119.5 MCS or 122.5 MCS plus all all aircraft operating within a 25 NM radius of RAP LF/R use extreme caution due to extensive flying of jet type aircraft at Ellsworth AFB. B52 aircraft departing runway 12 and 30 will maintain runway headings for approximately 25 NM climbing to 10,000 before starting turns. 0222152.

NEW WIND SOCKS

YOU CAN OBTAIN A STANDARD WIND SOCK FROM THE MONTANA AERONAUTICS COMMISSION FOR EIGHT DOLLARS. ORDER NOW — THE WIND MAY CHANGE!

BUREAU OF FLIGHT STANDARDS RELEASE NO. 431

Subject: Extension of Termination Date for Flight Instructor Rating Exchange Privileges—Jan. 30, 1959.

On December 30, 1958, the Civil Aeronautics Board adopted Amendment 20-8, which extends the termination date of flight instructor rating exchange privileges from July 1, 1958, to April 1, 1959.

The privilege of exchanging a flight instructor rating for a flight instructor certificate without further showing of competence was included in the provisions of amended Part 20 of the CAR adopted August 23, 1956.

A person failing to make exchange prior to April 1, 1959 does not lose his rating; however, he may not exercise the privileges of a flight instructor until he demonstrates to an FAA Inspector, by a practical test, his continued competence to give flight instruction and obtains a flight instructor certificate.

Signed B. PUTNAM,
for William B. Davis, Director
Bureau of Flight Standards

DO YOU KNOW?

Blueprints and drawings for a turbojet transport weigh 250,000 pounds—nearly equal to the plane's actual weight.

A turbojet transport has 115 fewer power-plant controls and instruments than the piston-powered plane, making it easier to fly.

To equal the speed of a 4-engine jet transport, a piston-powered airliner would require 30 engines.—Legion

FAA TO SURVEY GENERAL AVIATION

The newly created Federal Aviation Agency has announced plans for the conduct of a nation-wide general aviation survey during 1959. According to an announcement issued January 1 by Elwood R. Quesada, Administrator, the survey will be conducted in two phases. The first phase will be in January and early February of 1959 with the second phase in June and July. During the January survey, information will be obtained at selected airports during four 4-day periods. The January survey will cover 251 airports in Alabama, California, Colorado, Florida, Georgia, Illinois, Indiana, Iowa, Kentucky, Massachusetts, Michigan, Minnesota, Missouri, Nebraska, New Hampshire, North Dakota, Ohio, Oregon, Rhode Island, Texas, and Wisconsin.

FRIENDS AT STATE LEVEL

Airmen in many states can look for a concerted effort to either curtail or completely abolish their state aviation agency during the current year. This negative pressure has been building up during the past couple of years and will probably reach its peak in 1959 due to the financial plight most states find themselves in, the assumption that the new Federal Aviation Agency is a cure-all and that state functions are duplications of the Federal functions.

In those states where the gasoline tax is retained by the State, sometimes for support of the state aeronautics commission, the scheduled airlines are the chief adversary.

It would be wise for all airmen to keep well informed in such matters at the state level. In most states the aeronautics commission is the best friend aviation has—a protector and a developer. In many states it's very obvious that most aviation progress has derived from intelligent state aviation laws administered by dedicated aviation leadership. While this is not universally true, it certainly offers convincing proof that total power in Washington is not the answer to a healthy climate for aviation development.

According to the National Association of State Aviation Officials, the most critical situations will exist in the following states: Illinois, Michigan, California, Alabama, Wisconsin, Tennessee, Florida, Texas, Minnesota, Massachusetts and Pennsylvania with some agitation expected in others.

What is the situation in your state?

—(Editorial from Feb., 1959, Flight Magazine)

NATIONAL ASSOCIATION OF STATE AVIATION OFFICIALS

PURPOSE.—"To foster aviation as an industry, as a mode of transportation for persons and property and as an arm of the national defense, to join with the Federal Government and other groups in research, development, and advancement of aviation; to develop uniform aviation laws and regulations, and to otherwise encourage co-operation and mutual aid among the several states."

STATE AIRWAYS SYSTEM

The following Resolution by the Montana Aeronautics Commission establishes a State Airway System designating air routes between airports and air strips within the State of Montana.

Reference is made to Revised Codes of Montana, 1947, Chapter 1, Section 1-204, Paragraph (1) (The Montana Aeronautics Commission)

"STATE AIRWAYS SYSTEM—It may designate, design and establish, expand, or modify a State Airways System which will best serve the interests of the state. It may chart such airways system and arrange for publication and distribution of such maps and charts and notices and bulletins relating to such airways as may be required in the public interest. The system shall be supplementary to and co-ordinated in design and operation with the Federal Airways System. It may include all types of air navigation facilities, whether publicly or privately owned, provided that such facilities conform to Federal safety standards."

RESOLUTION

1. The Montana Aeronautics Commission, at a regular meeting of the Commission held in Helena on January 14, 1959, does hereby, by formal motion designate a State Airway System as follows:

A State Airways System is hereby established and includes air routes between the airports and landing strips serving cities and towns and other areas in the State of Montana.

2. The State Airways System includes a designated air space to a height of 1,500 feet above the ground and along a line drawn between the airports and landing strips and within a 2-mile radius of the center of landing areas as shown on the attached map and including the air space over a land area five miles each side of the designated line and on the routes so designated between the airports and landing strips located within the State of Montana or adjacent thereto, the names of which are included on the attached list which may be revised from time to time in amendments to this Resolution.

3. The federal airways within the boundaries of the State of Montana are included as part of the State Airways System. The rules and regulations of the Montana Aeronautics Commission pertaining to the State Airways System will apply to Federal Airways within the State of Montana with due consideration of and conformity to existing Federal legislation pertaining to Federal Airways.

4. A permit will be required by the Commission for authorization to build any structure over 150 feet in height above the ground and located within air space of the State Airways System.

Structures located within the air space of the State Airways System or within the immediate vicinity of airports and landing strips will conform to the standards and limitations prescribed by Federal legislation pertaining to tall structures, marking of obstructions, obstructions within control areas, turning zones and approach areas.

5. The Montana Aeronautics Commission will control and direct the operation of designated radio air to ground communication facilities located within or used for the emergency operation of aircraft along the State Airways System.

A hearing will be held by the Commission at the regular meeting of the Commission in Helena at 10:30 a.m., May 13, 1959, for the purpose of receiving comments or recommendations by interested persons in the matter of designation of the State Airways System and the regulations pertaining thereto.

(It is requested that persons desiring to appear at the Hearing make a request in writing to the office of the Commission in Helena advising of their intention to appear so that they may be scheduled on the hearing agenda.)

The contrasting and varying types of flying have increased the problem of air traffic control to such an extent that air space is now at a premium with Military Aviation, Scheduled Airline Operations, and General Aviation, all being different types of flying activities which will require the segregating of air space over our country, with the different types of aircraft being required to confine their operations to designated areas of air space.

The creation of a System of State Airways places the State of Montana in a position to arbitrate on the use of air routes and designate certain air routes which will be, in the future, kept available for use by the private airplane owner and General Aviation.

The building of tall structures which may be hazardous to aircraft operations is another problem, a partial solution to which has been answered by the establishment of antenna farms adjacent to larger communities. These antenna farms are a designated area in one quadrant of the low frequency range within which broadcasting companies are encouraged to place their radio and television towers. The development of micro-wave stations by industry and by communication companies has resulted in a need for coordination between agencies concerned of the use of the air space immediately adjacent to the ground. The increasing complexity of the above developments has made it desirable and necessary that the Montana Aeronautics Commission take action to establish this State Airways System.

It is fortunate that both Federal and State Agencies recognize the importance of the interests of the various users of air space and the Federal Aviation Agency emphasizes the rights and needs of the private airplane owner in their approach to the air space problem.

Your attention is invited to an address by Allan E. Horning, Assistant Regional Administrator of the 4th Region, which is published as a separate article in this newsletter.

CAA/FAA APPROACH TO THE AIR SPACE PROBLEM

Address by Allan E. Horning, Assistant Regional Administrator, 4th Region, Civil Aeronautics Administration, before the Fourth Air Force Staff Officers and Directors of Aeronautics from Washington, Oregon, California, Idaho, Montana and Utah, at Hamilton Air Force Base, California.

When General Smith invited me to speak at this meeting, he told me he was sure this gathering would be interested in some of the airspace control problems now threatening the good name—and I might add in some cases, the safety—of aviation and aviators in the United States, and in some of the steps Civil Aeronautics Administration is taking to improve the situation.

I was happy to accept because, as you know, the Civil Aeronautics Administration is up to now the Federal Government Agency responsible for resolving the nation's airspace control problems and my boss has handed this rather slippery ball to me here in the Fourth Region. I needn't add that we have just a few airspace problems out here in the West that need solving, some of them real close by.

Before we discuss solutions to these problems, let's take a look at the problem itself.

There are roughly 100,000 aircraft in the United States today and this number is growing steadily. There are an average of 200,000 flights daily in the United States under VFR conditions and this number is increasing. 50,000 of these flights are made from point to point.

Our air traffic control system is handling an average of 22,400 IFR operations daily. I think it is significant to note that this is a 10,000 per day increase in less than three years and an incredible jump of 5,100 a day since July 1 of this year.

I think it is also interesting to note that 73½ per cent of those operations are in the altitudes from the surface to 15,000 feet, 6½ per cent are in the altitudes between 15,000 and 24,000 feet; and an amazing 20 per cent or 4,500 of these flights are in the altitudes above 24,000 feet. These latter flights are, of course, up to now exclusively military jet operations. 450 of these military jets are on IFR during peak hours while, in addition, there are another 450 to 600 VFR jets airborne at the same time.

If this activity were spread evenly throughout the entire airspace, it wouldn't create any particular problem, but the great majority of this flying is concentrated along our airways and around our terminal areas.

Just to give you an idea of how concentrated it is in some locations, right here in the Bay Area for example, there was an average of 3,548 operations a day during the past twelve months. That, you must admit, is a lot of flying and a lot of concentration.

One of the first things we have to do in solving these problems is to recognize the conflict of interests between the major users of the airspace. Each of these users has a very valid right to use the airspace and each is entitled to have his rights protected.

The air carriers, who are engaged in the legitimate and highly important task of transporting the 40 million air passengers who flew between our cities last year certainly have a right to the use of our Federal airways.

The military who have the vital task of protecting our shores and skies from foreign agression have a clear and unmistakable mandate from the people and from the Congress of the United States for use of the airspace for tactical purposes, for training and for maneuvers.

General aviation, the largest single user of the airspace of all three, with its over 2½ **billion** miles of flying last year and over 65,000 aircraft, which range from Piper cubs to multi-engine transports, certainly has a clear right to fly into any legitimate area or airport they choose.

However, we must all recognize that the day of the unrestricted use of the airspace by any user has, like the day of the horse drawn carriage, vanished.

The fact we in aviation must all understand is that there are just too many airplanes trying to use the **same** airspace at the **same time.** And the airspace, as you well know, is our most rapidly vanishing natural resource. As an example of how rapidly the airspace is being used up, it takes an astonishing 4,000 to 6,000 square miles of sky 2,000 feet deep to give a 600 mile an hour jet the reserved airspace required under normal IFR operations when separation is maintained by time and altitude, and without radar or distance measuring capability.

To illustrate this further, it means that under present IFR separation standards, there could never be more than 550 of those high performance aircraft in the airspace at any one time, at the same altitude, over the entire continental United States, with its area of approximately 2,975,000 square miles.

The solution to this problem, while complex in its application, is simple in its thought.

Government, and each of the airspace user groups must clearly come to understand the needs and rights of the others, and by careful coordination and planning compact these needs into a workable package where all can realistically accomplish the necessary different missions involved.

The military, in the interest of safety, will have to accept more limitations on their use of the airspace. Needless to say, we can't allow such restrictions to deplete the effectiveness of their basic training programs, but they will certainly—in some cases—require a realignment of procedures and training areas.

The air carriers will have to accept more deviations in the airways to avoid restricted areas, and the vast fleet of general aviation aircraft and pilots will have to accept restrictions, and some specific equipment and pilot proficiency requirements, before they can fly into some areas and at certain altitudes. And an important corollary is that general aviation interests must be a part of our councils, particularly in order that they can share in shaping their own future. I will have more to say on this point later on.

We have several general programs involving airspace management under way at the moment. However, the one most important to safety is to segregate those military and other flight operations which are peculiarly incompatible with general aviation and air carried operations.

To accomplish this we have established joint CAA/military industry teams throughout the United States to analyze military requirements to determine the activity at the individual military bases in relation to the requirements of general aviation and air carrier operations in the area.

Our approach is divided into two parts. The segregation by procedural means of those operations which are adaptable to control by air traffic control and are compatible with VFR "see and be seen"; and the segregation by setting aside airspace by the designation of restricted areas for those operations that are not adaptable to control by air traffic control or do not provide for collision avoidance under VFR due to such factors as high speeds, unusual altitudes, pilot distraction from outside vigilance or volume of traffic. In the former this will generally mean control through the use of specific departure, approach and traffic pattern procedures offering separation from enroute and other traffic particularly under VFR conditions.

At this point, you might begin to think we were just going to turn over vast areas of geography to the military for their exclusive use. Actually this is far from being the case. In fact, the needs of civil aviation are a basic element in these considerations, and no segregation actions are proposed until the plans have been thoroughly coordinated with all affected users of the airspace.

There are many new ideas being used in solving this segregation problem. At the present, airways and control areas are defined as reaching from 700 feet to infinity. We propose to change this old idea and put a floor on airways and control areas in some places, and slide restricted areas under them. In other cases, a floor can be put under restricted areas, and an airway can be established in the airspace thereby made available. Joint use of airspace is also a possibility. When the military needs it, they have it; when they don't, it will be available to any user on clearance from Air Traffic Control. As an additional means of keeping VFR operations completely off certain high density airways, the altitudes between 17 and 22,000 feet on these routes have been designated positive control areas. This simply means you do not operate in, on, or across these airways between those altitudes unless you have an ATC clearance. More of these routes, with wider altitude coverage will be designated as we get the men and machinery necessary to handle the additional load on our traffic control system.

Our ultimate goal, desired by the users—both military and civil, and by ourselves as the service agency responsible for its implementation—is positive control of all airspace in the continental control area, initially above 24,000 feet and lowered gradually as our air traffic control capability increases, to some intermediate altitude that will embrace practically all IFR flying.

Another problem that has increasingly concerned a lot of us recently has been the high volume of both military and civilian training activity at some of our high density traffic terminals. I am convinced that the only solution to this problem is to divert some of this traffic to a satellite complex where the air carrier and the military pilot, both trainees, will be able to conduct his schooling without worrying about traffic conflicts. In my book, a guy in training status has enough to worry about to handle the monster in a competent manner with all the built-in emergencies a clever instructor can devise, without having to cope with the traffic on top of it all. Or, to put it another way, is it fair to the military pilot, the air carrier pilot with a load of passengers, or the passengers themselves, or to the puddle jumper driver, not to mention our boys, the controllers, to put them in the merry-go-round where trainees are shooting simulated ILS's at a modern high density airport? I believe we must move this training activity to properly equipped satellite fields.

An area of acute concern to the present CAA and to the forthcoming FAA, is the manner in which the new civil jet transport will be operated at altitudes requiring mixing with large numbers of military jets.

I think we must recognize that the high rate of closures experienced with jet aircraft makes it impossible to rely on the "see and avoid" principle of traffic separation, particularly at high altitudes.

The air carriers, the military, and general aviation owe a duty to the public to operate with the highest degree of safety. The CAA, and soon FAA as the Government Agency providing air traffic control, navaids, communications and airmen and aircraft certificates, has the obligation to insure that this is done.

Therefore, as an interim measure while we still have only a limited number of civil jet transports to handle, and while we are increasing the overall capability of our air traffic control system, we propose to require that all civil jet transports, in scheduled air carrier service conduct all their enroute operations under radar advisory control. We are working out the details with the military and the airlines to implement this interim program so that we can get the operation rolling. We will expand this concept just as fast as our own long range radar and other air traffic control capabilities are extended to handle the added workload. Right now we are planning, with the excellent cooperation of ADC and WADF, to place a CAA controller at selected ADC radar sites full time. ADC, at our request, is making a radar scope and communications equipment available at each of these sites for our use, so that we can monitor the progress of civil jet transports throughout their flights.

I wish to make it clear that we realize these initial steps toward our ultimate plan for compatible and safe operation of all classes of aviation, are not enough to give users of this airspace the freedom of operation they would like to have now and must have in the future. We do feel, however, that we have an obligation to insure safety by any immediate means available, and I am sure that a thoughtful look at these interim measures will prove that they are not unduly restrictive to any one segment of aviation when we evaluate the increased safety which they are designed to provide.

Before I leave this airspace problem, and some of its possible solutions, I should like to touch on a very real deficiency vitally connected to both the problem and to the solution. That is the lack of a unified and technically qualified voice speaking for general aviation, both in the initial studies of these safety proposals, and in our subsequent airspace subcommittee deliberations to put them into effect. As I see it, we have three operations groups in this aviation picture in the United States: the carriers, general aviation, and the military. Each is in the business of operating airplanes and therefore has certain airspace requirements. We in CAA, and the FAA, are not aircraft operators. We'd need darn little airspace to take care of our small fleet. So our only interest in airspace is from the standpoint of what is needed by each of the three operating groups to do their job today and to grow and expand with the rest of United States economy tomorrow. Congress has told us in CAA/FAA it is our job to figure out these requirements and to "assign by rule, regulation or order, the use of the navigable airspace under such terms, conditions and limitations as the administrator may deem necessary."

Now obviously, the Administrator cannot make such determinations in a vacuum. To make an equitable decision he must know the service requirements of each of the three operational groups and weigh the effect of various possible solutions on each. Since the Administrator cannot be intimately familiar with every operational problem in the country, he must depend on these three operational groups to state their needs to him. He will have the means to check the validity of the various claims and to continuously check on the use being made of the air space, but the basic statement of need must come from the operations people.

The point I wish to make here is that the Air Carriers, through their Air Transport Association and the Air Line Pilot group, have very effective and technically competent channels through which to present their operational requirements for airways, control areas and facilities as well as to present opposing arguments against restrictions to their operations proposed by other groups. The military, through their Air Force, Navy and Army representatives, and staffs assigned to the Regional and Washington committees, have equally proficient representation. The Airports people, through the Airport Operators Council and American Association of Airport Executives likewise are well represented. But general avaiation must depend on being heard through either the NASAO, AOPA, or individual representatives. Now no one is more vociferous in looking out for the needs of general aviation than Clyde Barnett when the problem is in California, but he often finds himself way out in left field when it comes time to bat for a general aviation segment in another of our western states. The same is true of Frank Wiley at our Seattle meetings when the problem is outside Montana. It is also obvious that Bert Rhine and Doctor Flynn, as much as they have done for general aviation, cannot take time from their businesses to investigate in detail every airspace proposal which comes up, to the point where they can cover the technical aspect of the proposal's effect on general aviation in a given area. Our General Safety inspectors are always included as team members in our studies of airspace and segregation proposals, and their opinions are a part of the considerations leading to possible solutions. However, once these solutions are presented for airspace consideration, the CAA is in the position of an impartial arbiter and cannot take sides for one segment of the operations group against another. We have presented what looks to us like the best solution to a given problem, and the Administrator's final decision must be based on facts presented by the operations group themselves. It seems to me a shame that the largest and fastest growing segments of aviation in the United States does not yet have full time skilled technical representation to present their problems and their needs.

In conclusion, I might touch briefly on the Federal Aviation Act passed during the last session of Congress and signed by the President on August 23. You will note the word "Federal" in the title of the new Act as distinguished from "Civil" in the old Act of 1938. Our airways are now "Federal Airways" not "Civil Airways." The principal effect of the new legislation is to place the responsibility for regulating and controlling ALL air operations, not just civil operations, with the Administrator of FAA. This, of course, does not apply to military operations directly connected with a national emergency or actual war. The Act provides that the Administrator shall develop, in consultation with the Defense Department and other affected agencies, plans for the effective discharge of operations in such an emergency. These plans must be submitted to Congress by January 1, 1960.

The new Federal Aviation Agency is an independent agency, not subordinate to any other department and will report directly to the President. It will be headed by an Administrator, Elwood "Pete" Quesada, and a Deputy Administrator, still to be named. Incidentally, I seem to remember a Quesada who did a little flying at Hamilton Field in an old Fokker called the "Question Mark." On January 1, 1959, all employees, property and funds of the CAA will be transferred to FAA. A similar transfer of personnel and equipment formerly assigned to the Airways Modernization Board has already taken place. The Act also provides for the transfer of certain rule making functions, both air traffic and airworthiness, formerly vested in the Civil Aeronautics Board, to the new Agency. The Board will continue to look to the economic welfare of the nation's air carrier and also retain their present responsibilities for accident investigation.

I am sure we will all agree that the new Federal Aviation Agency is a positive step in the right direction, and when fully implemented with specialists transferred from the military, and the help of some top men from the civil aviation industry, will do much to aid in the proper and necessary development of aviation in the jet and space age. We are not naive enough to think that all our problems will now automatically be solved merely by the creation of this new Agency, but we have every confidence that with all segments of aviation working together in a house united, we can be assured of coordinated accomplishments. Certainly all of us will be striving for this goal.

SPUR LINE FOR AN AIRPLANE

By M. F. Vanleveer

Project Engineer, Great Northern Railway

Glasgow, Montana, (pop. 3,821, 1950) rises out of that lonely rolling land just a few horizons east from the shadow of the Rockies. It is hard country, but it maintains a unique charm for those rugged men who like to walk for 20 miles in any direction without running into a fence

Here, in the land where the Great Plains begin, appearances mean little A man with patched dungarees may be a drifter just passing through town, or he may be running for Congress.

Glasgow started life on the prairie in 1887 when it was known as "Great Northern Railway Company Siding Number 45." This was a little too much name for such a small town so it became "Glasgow" the following year when the territory was opened for settlement

Since that time, Glasgow's Main Street has seen everything from Indians, land boomers, and prospectors to cattlemen, gunmen, and dam builders Early in 1960, the people of Glasgow will meet a different type of stranger—a highly refined product of our generation—the jet pilot.

About 15 miles to the north and a scant 40 miles from the Canadian Border, the Glasgow Strategic Air Command Base is taking shape under the skilled hands of Peter Kiewit Sons Company In order to put down the miles of concrete required for a heavy bomber base, Kiewit's crews have been confronted with all the normal problems of a contractor plus a few exceptional ones

The nearest (and only) railroad was the Great Northern main line through Glasgow. Unless a spur line could be built, the contractor faced the expensive and time consuming proposition of trucking all steel, cement and supplies over 20 miles of winding highway.

The Great Northern engineers had made preliminary surveys to determine the most feasible route in case the problem should come up It came up on the 11th of June

"The chief called me in and said it was on the fire," commented Great Northern Engineer V C Hankins "That afternoon we issued orders for all available rails, ties, hardware and men to be shipped to Glasgow. Four days later we started the framing yard by the siding there and we had thirty-five men building prefabricated panels of track"

Negotiations for right of way were initiated immediately. Meanwhile, over 15 miles of prefabricated track panels were being built and stacked in the framing yard at Glasgow Each was complete with ties, rails, tie plates and joint bars, the latter loosely bolted to one end.

On the 23rd of July, Peter Kiewit Sons, who had successfully bid on the earthmoving contract, pushed the first dirt at the Glasgow end of the right-of-way. Ten days later, a 40-ton locomotive crane moved out over the new switch-point and dropped the first track panel into place

The earthmovers were slicing through the rolling hills just a short distance ahead of tracklayers. In order to maintain the pace, they needed drainage structures which could withstand the combined weight of the high fills and the locomotive crane which would pass over within a few days after they were installed But most important, they had to be available immediately.

Over 3,500 feet of Armco Asbestos-Bonded culverts in varying sizes were rushed to Glasgow. In all, 69 corrugated metal drainage structures were put under the spur line, with Hel-Cor Perforated pipe for sub-drainage.

The six-man track laying crew looked like a bunch of kids with an electric train at Christmas Completed 33- and 39-foot panels were swung into place, lined and bolted with an urgent speed In a single record-breaking day, the crew placed 6,700 feet of track

The track panels were loaded on flatcars at the framing yard in Glasgow and moved over the newly laid track to the railroad The locomotive crane would swing to the rear, pick up a panel, then swing to the front and lower the pre-fab section until one end touched the ground. Since "fishplates" had been fastened to one end of each rail at the framing yard, all that was needed was the insertion of a bolt to hold the panel in place. As the large crane swung to the rear to pick up another panel, the six-man crew finished bolting the first panel in place.

When the flatcar nearest the crane had been emptied, it had to be removed before the next full car could be moved forward. Because of the urgency of the job, the empty car was simply lifted off the track one end at a time and dropped beside the roadbed. About twenty-one cars were removed from the rails every hour Walking along the right of way, it looked as though a young Paul Bunyon had grown tired of his toys and knocked them all off the track.

By September 13, the line had reached the Air Base boundary On the following day, it was completed except for the contractor's temporary trackage at the construction site. The crew could then turn their efforts to ballasting, tamping and proper lining of the track

Although the primary purpose of the spur was to expedite construction of the vital airbase, it will soon be used to bring in the fuel, supplies, and material needed to keep the Strategic Air Command in the sky.

Sometime next year, the ranchers north of Glasgow may see the clear Montana air split with the lacy vapor trails of a B-52 on its way to a rendezvous 30,000 feet over the North Pole. They can reflect that it took a lot of people to put it there. Some of the people were scientists Some were contractors, engineers or factory workers. Some were just taxpayers And some, oddly enough, were descendants of the men who tied this country together in another century—men who made steel wheels move on steel rails

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"LET UP ON THE LIGHT UP"

Unfortunately most pilots do not recognize that tobacco acts in a way similar to alcohol, as far as vision is concerned. Tobacco also reduces your altitude tolerance, partly by cutting down on your supply of oxygen and partly by increasing the rate at which your body uses oxygen.

The carbon monoxide which results from the incomplete combustion of tobacco is the very same gas that comes from the engine

Incomplete burning of tobacco puts a small percentage of carbon monoxide in the smoke and whether you inhale or not, the carbon monoxide is absorbed by the blood stream in place of oxygen. If you do inhale you simply make things easier for the carbon monoxide. When the blood stream is loaded with carbon monoxide, any oxygen trying to get in finds all the parking spaces occupied, and so proceeds blithely on its way.

Blood Absorbs 'Co' Fast

The fact that blood actually prefers carbon monoxide to oxygen and absorbs it 210 times as readily, makes things worse. If you're a heavy smoker, you can get as high as 10 per cent carbon monoxide blood saturation. It takes only three percent to cause measurable impairment of functions, such as vision, and altitude tolerance.

With the 10 percent concentration possible by heavy smoking, you are halfway to the 20 percent state With 20 percent saturation you are in pretty bad shape, and might not be able to continue reasonably safe control of your aircraft because of throbbing headache, visual impairment, reduced power of concentration, and muscular incoordination

Insidious Effects

One of the insidious things about CO poisoning is that you are subject to sleepiness, reduced mental and physical powers and some loss of vision prior to any recognizable symptoms, such as a headache

If you have been smoking steadily, you have enough carbon monoxide in your blood so that at 10,000 feet altitude your body acts as though it were at an altitude of 14,000 or 16,000 feet. Your vision will be correspondingly affected

In fact, smoking just three cigarets in a relatively short period before takeoff will reduce your night vision as much as the effects of 8,000 feet of altitude. One cigaret results in a saturation of 1 to 1 5 percent of your hemoglobin with carbon monoxide instead of oxygen.

Once carbon monoxide enters the blood stream it leaves very slowly, like alcohol. About half of it is still present at the end of 6 hours, and there may still be some left at the end of 24 hours.

Effects of Nicotine

At the same time another product of smoking causes problems—namely, nicotine. Nicotine raises your requirement for oxygen by 10-15 percent. A further adverse effect of nicotine is its interference with your reactions. It also increases your nervous instability and tires your mental processes. Night vision is reduced, and your depth perception can really get knocked off center A smoldering cigaret also produces ammonia which irritates the eyes.

The pilot who wants to fly at optimum efficiency and safety will try to reduce his smoking, especially just before flights, and most especially before night flights.

"THANKS TO THE U. S ARMY FOR THIS ARTICLE"

FAA BULLETINS ON AIRCRAFT

The following listed FAA bulletins of Air Worthiness Directives are published by the National Insurance Advertisers in their publication on Flight Safety, Edition No. 3:

ERCOUPE—Model 415-C, 415-D, 415-E, 415-G

46-23-1	Muffler Replacement
46-23-2	Engine breather line hose
46-23-3	Aileron control column fitting
46-36-1	Continental piston pins
46-38-2	Aileron control stop
46-38-3	Fuel system elbow fitting
46-46-1	Fuselage Gas Tank overflow line
46-49-1	Nose wheel replacement
47-20-3	Fuel pump line alteration
47-20-4	Baggage compartment zipper
47-20-5	Belly skin reinforcement
47-20-6	Aileron reinforcement
47-20-7	Rudder reinforcement
47-20-8	Battery Box drain
47-20-9	Voltage regulator check
47-40-2	Continental C75 and C85 piston pins
47-42-20	Control column shaft
50-7-1	Elevator trim tab stop
52-2-2	Aileron inspection
52-25-2	Federal nose ski
54-26-2	Control cab fraying
55-22-2	Terneplate fuel tank
57-2-1	Rudder horn attachment
57-13-3	Rear spar inspection

TAYLORCRAFT—Model BC, BCS, BC65, BCS65, BC12-65, BCS12-65 BC12D, BC12D1, BCS-12D1

46-36-1	Continental piston pins
47-13-2	Fuel hose
47-16-3	Wing strut fittings
50-41-1	Elevator horn bolt
51-9-3	Fuel shutoff valve clip

Model F, BFS, BF60, BF-65, BFS-65, BF12-65, BFS12-65

47-16-3	Wing strut fittings
50-41-1	Elevator horn bolt
51-9-3	Fuel shutoff valve clip

Model BL, BLS, BL-65, BL-12-65, BLS12-65

47-16-3	Wing strut fittings
50-41-1	Elevator horn bolt
51-9-3	Fuel shutoff valve clip

Model DC-65, DCO-65

46-36-1	Continental piston pins
51-9-3	Fuel shutoff valve clip

PIPER—PA22, FAA Mandatory Bulletins

51-19-2	Oil radiator hose
51-23-3	Battery box insulation
51-27-3	Nose wheel drain
53-24-4	Fuel-hydraulic lines
55-7-2	Landing gear tube reinforcement
55-8-4	Ignition filter replacement
55-22-3	Fuel tank cap
56-26-2	Fuel tank cap-rework
57-17-2	Seat belt attachment bracket
57-20-3	Wing lift strut fork
57-22-1	Fire prevention rework

58-10-2 Inspection of wing lift strut fork
58-16-1 Installation of fuse between cigar and ammeter

Model J3
47-50-3 Canvas seat inspection
51-15-1 Clevis bolt inspection
52-7-3 Lift strut rework

Model J3C-40-50-50S
47-50-3 Canvas seat inspection
47-50-5 Float wirepull fitting
51-15-1 Clevis bolt inspection
52-7-3 Lift strut rework

Model J3C-65, J3C-65S
46-36-1 Continental piston pins
46-37-1 Fuel strainer gasket
46-37-2 Fuel strainer position
47-40-2 Continental C75 and C85 piston pins
47-50-3 Canvas seat inspection
47-50-5 Float wirepull fitting
47-50-6 Shock strut cracks
49-14-1 Elevator connector tube fitting
50-5-1 Nicopress sleeve rework
51-15-1 Clevis bolt inspection
52-7-3 Lift strut rework

Model J3F, J3F-S, J3F-65
47-50-3 Canvas seat inspection

Model J3F-65S
49-14-1 Elevator connector tube fitting
51-15-1 Clevis bolt inspection
52-7-3 Lift strut rework

Model J3L, J3L-S, J3L-65
47-50-3 Canvas seat inspection

Model J3L-65S
49-14-1 Elevator connector tube fitting
51-15-1 Clevis bolt inspection
52-7-3 Lift strut rework

Model J3P
47-50-3 Canvas seat inspection
51-15-1 Clevis bolt inspection
52-7-3 Lift strut rework
58-1-7 Inspection of fork ends of turnbuckles in control system
58-12-2 Inspection of aileron hinge reinforcing brackets
47-40-2 Continental C75 and C85 piston

Model PA-11
47-50-5 Float wirepull fitting
47-50-6 Shock strut cracks
48-3-3 Header tank installation
49-14-1 Elevator connector tube fitting
50-5-1 Nicopress sleeve rework
51-15-1 Clevis bolt inspection
52-7-3 Lift strut rework
58-12-2 Inspection of aileron hinge reinforcing brackets

STINSON—108, 108-1
47-50-11 Ash tray modification
47-50-12 Stabilizer attachment fitting
47-50-13 Koppers propeller hub
48-50-1 Franklin cylinder base flange
50-17-2 Rudder cable inspection
54-2-2 Federal ski rigging
50-25-1 Fuel drip strip

Model 108-2
47-50-11 Ash tray modification
47-50-12 Stabilizer attachment fitting
47-50-13 Koppers propeller hub
49-16-2 Wing fabric inspection
50-17-2 Rudder cable inspection
50-25-1 Fuel drip strip
50-34-1 Koppers F-200 propeller
50-47-1 Sensenich propeller blades
54-2-2 Federal ski rigging

Model 108-3
49-16-2 Wing fabric inspection
50-17-2 Rudder cable inspection
50-25-1 Fuel drip strip
50-34-1 Koppers F-200 propeller
50-47-1 Sensenich propeller blades
54-2-2 Federal ski rigging

MILITARY AIRCRAFT DESIGNATIONS

U. S. AIR FORCE

Example C-133 A

Basic Mission Letter
Air Force Model Number
Mfr's Modification Letter

Basic Mission Letter

A—Amphibian
B—Bomber
C—Cargo and Transport
D—Director
E—Early Warning
F—Fighter or Interceptor
G—Carrier
H—Helicopter
K—Tanker
L—Liaison
M—Medical
P—Passenger
Q—Target and Drone
R—Reconnaissance
S—Search and Rescue
T—Trainer
U—Utility
V—Staff
W—Weather
X—Research Aircraft

U. S. NAVY

Example R 4 Y-1

Basic Mission Letter
Mfr's Model Number
Mfr's Code Letter
Modification Number

Basic Mission Letter

A—Attack
D—Drone
F—Fighter
G—Glider
H—Helicopter
O—Observation
P—Patrol
R—Transport
S—Anti-Sub
T—Trainer
U—Utility
W—Warning
X—Experimental

Manufacturer's Code Letters

B—Boeing
D—Douglas
E—Hiller
F—Grumman
H—McDonnell
J—North American
K—Kaman
L—Bell
M—Martin
N—Navy Air Development Center
P—Piasecki
Q—Fairchild
S—Sikorsky
U—Chance Vought
V—Lockheed
Y—Convair

AIRSHIPS

ZH Search and Rescue
ZP Patrol and Escort
ZT Training
ZU Utility

MISSILES

AAM Air-to-air missile
AICBM Anti-intercontinental ballistic missile
AIRBM Anti-intermediate range ballistic missile
ANSAM Anti-missile surface-to-air missile
ASM Air-to-surface missile
AUM Air-to-underwater missile
CBM Continental ballistic missile
DICBM Defense intercontinental ballistic missile
FBM Fleet ballistic missile, U S Navy
GAM Guided aircraft missile
GAR Guided aircraft rocket
GM Guided missile
ICBM Intercontinental ballistic missile
IM Interceptor missile
IRBM Intermediate range ballistic missile
MRBM Medium range ballistic missile
SAM Surface-to-air missile
SM Strategic missile
SRBM Short range ballistic missile
SSM Surface-to-surface missile
SUM Surface-to-underwater missile
TM Tactical missile
TV Test vehicle
UAM Underwater-to-air missile
USM Underwater-to-surface missile
XM Research missile
YM Prototype missile

PARRISH ARTICLES ON RUSSIA

The following articles by Wayne W. Parrish, president and publisher of American Aviation Publications, were written for and distributed by the Associated Press.

Civil Aviation in the USSR—I

The Soviet Union is taking gigantic strides in civil aviation. If the pace of the last two years continues, it will become the biggest aviation nation in the world within five years at the outside.

Three years ago it was easy to assess Soviet Civil Aviation as being 20 years behind the West. At that time I flew 4,000 miles on Russian airplanes in the Soviet Union and its satellites. It is a vastly different story today. The Soviet Union has moved into the jet age in a big way.

I have just completed 10,000 miles of flying on the Russian airline, Aeroflot, to such faraway points as Irkutsk in Siberia and to Tashkent and to other points in Central Asia. Three-fourths of this flying was in the 70-passenger twin-engined Tu-104A jet.

In terms of actual jets in operation, the Soviets are far ahead of the West. But an overall assessment would be that the West is still a considerable distance ahead in passengers carried, passenger handling, operational and communication techniques and ground facilities. However, the Soviet Union has moved up on the West with quite astonishing speed.

Will Give West Something to Think About

At least three new types of transport planes will go into service in 1959, possibly four. And the new series of airplanes will give the West something to think about. They are more efficient, they look better. They are nothing like the Tu-104A jet, a converted bomber, which the West has seen in Europe and the United States.

Within the next few years it seems clear that the Soviet Union intends to compete strongly for the export market. Its airplanes may not be up to the high standards of the West, but the price differential may well appeal to many countries that can't afford the costly products of the United States, France, and England.

The main thing that impresses the visitor to Russia today is that Ivan is on the move. Every trunk route airplane seat is filled. Airport terminals are crowded. Traffic is no longer confined to the elite, the government officials, the collective farm chairmen, the factory director, and the like.

Just ordinary people were boarding jets in Moscow to fly the one-stop, 3,000 mile route to Irkutsk in Siberia—and doing it as though they had been flying the route for 20 years. It is six hours flying as against five days by train.

Lack of Good Food Service Draws Complaints

Not only have the Russians accepted airplane flying as routine, but they are beginning to expect service. Three years ago there was no such thing as a meal served in flight, much less a hot meal. Today three stewardesses serve hot meals of pretty good quality and variety on the jet flights and passengers are beginning to complain about the lack of good service on the smaller twin-engined planes on short routes.

What is of great importance to the West is the Soviet policy behind the big upsurge in aviation. It is a policy to take the Russian traveler off the railroad and put him into the air. To do this, airline fares have been lowered to the level of railroad coach rates. All facilities being owned by the state, the airline has no major worries about profits and dividends, although Aeroflot officials insist the airline makes money.

There is virtually no intercity transportation by automobile, and the highway system is abominable. Now that Russians have a great deal more freedom to move about their own country, the railroads are completely inadequate to handle the traffic. In addition, the Soviet Union covers a pretty big area of the world. Using air as the primary transportation medium for passengers seemed to be the only solution.

Thus the aviation potential in Russia is enormous. In the United States, 88 per cent of intercity passenger travel is by automobile. The United States has become a nation on wheels, and air transportation is far down in second place.

The Soviets are trying to accomplish in a few years what the West performed in 20, and it is obvious the rapid growth is causing many stresses and strains. There have been two fatal crashes of the Tu-104A, only one of which the Russians were forced to admit because of the deaths of prominent foreigners. There is no doubt these two accidents have given airline officials much concern, because at least one of the crashes is quite a mystery.

Airports are only partially adequate, although construction and extension of runways is evident everywhere. Terminal facilities are strained, and communications are slow. But the Russians aren't used to frills and what they fail to accomplish by precision they accomplish by a mass approach.

I was permitted to see only one of the new airplanes scheduled to go into service in 1959. It was the Ilyushin 18, the Moskva, a 95-passenger job with four turboprop engines. It will cruise at about 400 miles per hour at 27,000 to 30,000 feet. The interior is bright, the furnishings vastly better than earlier types. It has the appearance of a top-flight airplane.

The Moskva can be used on the North Atlantic, with reduced passenger load, and is ideally designed for services with Russia and to European capitals.

Great Claims Made for Tu-114 Performance

The big showcase to come, however, is the Tu-114, already behind its timetable. It was due in service this year When I was in Moscow, I was assured I could see the airplane if it returned from its test runs, but it was still undergoing trial runs somewhere.

No Westerner has yet had a look at the Tu-114 but great claims are made for its performance It is to carry 180 passengers and has a 48-seat diding room in a lower deck It is supposed to fly at about 500 miles an hour, but Western engineers are skeptical of such a speed claim for a turboprop airplane

Another model, perhaps more promising is the An-10, the Ukraina, a turboprop type designed for 84 to 125 passengers with acruising speed of 325 miles per hour It is also scheduled for debut in 1959

In the turbojet field, the Tu-104B, an enlarged model of the jet now flying, with 30 more seats for a total of 100, is due to fly in 1959 A current mystery is the Tu-110, a very fast turbojet transport announced some time ago, which was to match the best U. S and British long-range transports. Inquiries about the Tu-110 merely brought the response that it is being tested.

Soviets Have Left Plush Intercontinental Market to West

The West has concentrated on long-range high-speed turbojets carrying many passengers, such as the Boeing 707, the Douglas DC-8, the Convair 880, and the Comet 4, but the Soviet Union has concentrated on turboprops with less speed but many seats and more efficient operating characteristics for medium-range operations.

Thus the Russians have left the plus intercontinental market to the West, while it will have a complete line of medium-range high-density equipment available, not only for internal Soviet routes, but for satellites and any other nations that can't afford anything else

The next two years will tell much. One thing is sure—the Soviet Union is going to be a far bigger contender in civil aviation than anyone in the West thought possible five years ago. No nation has moved so far in so short a time.

AVIATION ALPHABET SCOOP
LEAR INCORPORATED

Do you speak ACRONYM?

Once upon a time a knowledge of English was all one needed to communicate successfully with the natives of the aviation industry But since World War II, a new language has arisen, and unless some fluency in it is acquired, exchange of information or trade with the linguistic tribes of the Pentagon, the Primes, the Pilots, and the Aviation press is all but impossible

Scholars call this strange new tongue "Acronym," because its vocabulary is formed by combining the initial letters or syllables of other words, as WAC for Women's Army Corps

The rate of word coinage in acronym is prodiguous. Every day dozens of new formations appear in our periodicals, often with no apparent effort on the part of the writer to define his meaning or the word's derivation Acronmy innovators are so bewitched by its possibilities that many new organizations and activities are dubbed with highly improbable names simply to permit the back-formation of startling and whimsical abbreviations from the initial letters. The abbreviation is created first, then the name For example, why else should the Vanguard project be christened "minimum Orbital Unmanned Satellite of the Earth" except to make it come out acronymously as MOUSE?

To keep up with the demand for tricky coinages, the ingenuity of mere man is being supplanted by verbal automation. A large drug company employs a full time IBM data processing machine to devise Acronym names for its many newly created products All the letters and symbols contained in the names of the chemical elements making up the nostrum are fed into the electronic gullet of the machine, and out comes a spate of synthetic verbal barbarisms such as zostrex, herposan, augstap, dreckmycin, and hysofluh. Noah Webster must surely be turning over in his grave.

And as perhaps the ultimate travesty on this trend, we are now beginning to see the abbreviation of abbreviations. Witness CSCN/CHSA, which is an abbreviation of ComSubCon Nelm/ComHedSuppAct, which in turn is an abbreviation of "Commander, Subordinate Command, U. S Naval Forces Eastern Atlantic and Mediterranean Command Headquarters, Support Activities"

A glossary is nearly a "must" to anyone trying to find his way through the thickets of this new dialect. To meet the needs of its friends in the aviation industry, Lear Incorporated has compiled this guide to Acronyms most commonly encountered in today's aviation parlance Our list makes no pretense at being exhaustive. Each branch of the military service has created its own sub-dialect of Acronmys to serve its highly specialized operational activities, and it would be hopeless, as well as unprofitable, to try listing all of these intramural expressions A Naval Air Officer discussing his FASRONS (Fleet Aircraft Service Squadrons) will always remain incomprehensible to the Air Force Pilot concerned with his GEOREFS (Geographical Referencing System), and it is beyond our purpose to serve as interpreter between them

But since it is our purpose to make this booklet as useful as possible to all the aviation administrators and executives endeavoring to understand each other in the conduct of their business, any suggestions for inclusion in future editions will be warmly welcomed. Please send them ASAP

Norman Warren,
Director of Advertising and Public Relations,
Lear Incorporated,
3171 South Budy Drive
Santa Monica, Calif

VIP ATTEND PLUSH, OKLA. LODGE OPENING

Governor-to-be Edmundson said be hoped this was the first of many park airports for the flying public to use.

The new lodge is located near Waggoner, Oklahoma, in Sequoyah State Park, just north of Muskogee, Oklahoma The landing strip is hard surfaced—new and should be used often for full benefits

Over a hundred personal planes landed for the opening, from wee tandem types, to Aero Commanders The Cessna 150 from Yingling in Tulsa was most heavily fingerprinted Transportation to and from the lodge was furnished, four minutes by car.

Hundreds of invited guests milled through the "plush" new lodge which features wall to wall everything, little stage coaches (authentic) with hosses, partner, which take you to the landing strip, or wooded cottages if you want rustic living with only one butler Horses, hay rides, swimming, fishing, yachting, boating or water skiing is available. Panty waists and cuddle types will find wood-burning fireplaces, decks of cards and convival company if they bring their own

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Remember, if your senses differ with the instruments, it is probable your sense are wrong.

FOR SALE

85-hp. Ercoupe, A-1 condition. 90 hrs. since engine major, sens. all, 8 day clock, T&B-R/C-L/F radio, lights, metal prop. etc.—Tom Crum, Box 316, Columbia Falls, Montana

Mooney Mite, 65 hp. Cont. New canopy, prop. and tins. VHF radio. Recent annual. Very clean. $1,595.—Douglas W. Brown, 509 6th Ave., N., Great Falls, Montana.

Lear LTRA-6 Aircraft Radio with four crystals, less antenna, excellent condition $225.00.—Howard F. Cornwell, Forsyth, Montana.

Piper P.A.-12 Cruiser. Fair condition, 6 hr. TTSMOH Engine. Would like to take 85hp. J-3 or older Aeronca 85 trade-in. —Son Smith, Rudyard, Montana.

1954 Cessna 180, 1032 T.T. A&E 320 since major of engine, New 1959 paint stripe with Day Glo, McCauley prop. six cylinder primer, Engine driven vacuum system, Cross-wind gear, Flares, L.F. Receiver Narco Omniplexer, Narco Simplexer, Outside air temp. Rate of climb. Safe Flight Indicator. Full gyro panel. Sensitive altimeter, eight-day clock. Contact Malta Flying Service, Gene Mendel.

1947 Piper PA-12 750 hrs. total aircraft and engine. Low frequency transciever with optional VHF transciever. For further information call B. J. Bounds, GL 3-6694 Great Falls, or Mr. Garner, GL 3-4333, Great Falls.

WANTED

Cracked-up PA-11 or PA-18. Where is it and how much? Write Box 1698, Montana Aeronautics Commission.

FAA Quarterly Inspection Itinerary

	April	May	June
Bozeman	14*, 15**	12*, 13**	16*, 17**
Great Falls	8*, 9**	6*, 7**	10*, 11**
Helena	6, 13, 20, 27	4, 11, 18, 25	1, 8, 15, 22, 29
Missoula	22*, 23**	27*, 28**	24*, 25**
Billings	6, 13, 20, 27	4, 11, 18, 25	1, 8, 15, 22, 29
Glasgow	15	13	10
Glendive	22	20	17
Miles City	23	21	18
Wolf Point	16	14	11

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